

What is claimed is:

1. A fluidized bed incinerator having a combustion furnace comprising:

first to fourth combustion sections, and

wherein a fuel is supplied to said first

5 combustion section and an combustion exhaust gas is exhausted after said fourth combustion section,

first to fourth airs are supplied to said

first to fourth combustion sections in first to fourth air surplus rates, respectively, and

10 said second air surplus rate is equal to or more than said first air surplus rate, said third air surplus rate is equal to or more than said second air surplus rate, and said fourth air surplus rate is equal to or more than said third air surplus rate.

2. The fluidized bed incinerator according to

claim 1, wherein said first combustion section

combusts the fuel in a first temperature range in a

deoxidation atmosphere by said first air, to suppress

5 generation of NO<sub>x</sub> and dioxine,

said second combustion section combusts a

non-combusted component of the fuel in a second

temperature range in the deoxidation atmosphere by

said second air, to suppress the generation of NO<sub>x</sub> and

10 dioxine and to dissolve NO<sub>x</sub> and dioxine generated in  
said first combustion section,

said third combustion section combusts a non-combusted component of the fuel in a third temperature range by said third air, to suppress the generation of  
15 NO<sub>x</sub> and dioxine and to dissolve NO<sub>x</sub> and dioxine generated in said second combustion section, and

said fourth combustion section carries out complete combustion of a non-combusted component of the fuel in a fourth temperature range in oxidization  
20 atmosphere by said fourth air, to suppress the generation of NO<sub>x</sub> and dioxine and to dissolve NO<sub>x</sub> and dioxine generated in said third combustion section.

3. The fluidized bed incinerator according to claim 2, wherein said first to third temperature ranges are substantially the same.

4. The fluidized bed incinerator according to claim 2, wherein said first to third temperature ranges are a range of 800 °C to 900 °C.

5. The fluidized bed incinerator according to claim 2, wherein said fourth temperature range is equal to or lower than each of said first to third temperature ranges.

6. The fluidized bed incinerator according to claim 2, wherein said fourth temperature range is a

range of 750 °C to 850 °C.

7. The fluidized bed incinerator according to claim 2, wherein said first temperature range of said first combustion section is controlled by a first temperature control section.

8. The fluidized bed incinerator according to claim 2, wherein said fourth temperature range of said fourth combustion section is controlled by a second temperature control section.

9. The fluidized bed incinerator according to claim 2, wherein said second and third temperature ranges of said second and third combustion sections are controlled by changing said second and third air surplus rates, respectively.

10. The fluidized bed incinerator according to claim 1, wherein said first air surplus rate is in a range of 0.5 to 0.7, said second air surplus rate is in a range of 0.7 to 0.9, said third air surplus rate is in a range of 0.9 to 1.15, and said fourth air surplus rate is in a range of 1.15 to 1.6.

11. The fluidized bed incinerator according to claim 1, wherein a residence time of a combustion gas

in said first combustion section is in a range of 1.5 to 2.5 seconds,

5           a residence time of a combustion gas in said second combustion section is in a range of 0.5 to 1.5 seconds,

              a residence time of a combustion gas in said first combustion section is in a range of 0.1 to 1.0  
10 second, and

              a residence time of a combustion gas in said first combustion section is in a range of 1.5 to 2.5 seconds.

12.          The fluidized bed incinerator according to claim 1, wherein said first combustion section is a fluidized bed combustion section, and has a first air supply port provided in a bottom of said first  
5 combustion section.

13.          The fluidized bed incinerator according to claim 12, wherein said second combustion section has a second air supply port provided in a range of 1500 to 2100 mm from the bottom;

5            said third combustion section has a third air supply port provided in a range of 3100 3700 mm from said bottom; and

              said fourth combustion section has a fourth air supply port provided in a range of 4100 to 4700 mm

10 from said bottom.

14. The fluidized bed incinerator according to  
claim 13, further comprising a fuel supply port  
provided between said second air supply port and said  
third air supply port.

15. A combustion method in a fluidized bed  
incinerator comprising the steps of:

(a) supplying fuel to a first combustion  
section as a fluidized bed;

5 (b) combusting the fuel in a first  
temperature range by first air supplied to said first  
combustion section, while suppressing generation of  
NO<sub>x</sub> and dioxine;

10 (c) combusting a non-combusted component of  
the fuel in a second temperature range by second air  
supplied to a second combustion section, while  
suppressing the generation of NO<sub>x</sub> and dioxine and  
dissolving NO<sub>x</sub> and dioxine generated in said first  
combustion section;

15 (d) combusting a non-combusted component of  
the fuel in a third temperature range by third air  
supplied to a third combustion section, while  
suppressing the generation of NO<sub>x</sub> and dioxine and  
dissolving NO<sub>x</sub> and dioxine generated in said second  
20 combustion section; and

(e) carrying out complete combustion of a non-combusted component of the fuel in a fourth temperature range by fourth air supplied to a fourth combustion section, while suppressing the generation 25 of NO<sub>x</sub> and dioxine and dissolving NO<sub>x</sub> and dioxine generated in said third combustion section.

16. The combustion method according to claim 15, wherein said (b) and (c) steps are carried out in a deoxidation atmosphere.

17. The combustion method according to claim 15, wherein said (e) step is carried out in an oxidation atmosphere.

18. The combustion method according to claim 15, wherein said first to fourth airs are supplied to said first to fourth combustion sections in first to fourth air surplus rates, respectively, and  
5 said second air surplus rate is equal to or more than said first air surplus rate, said third air surplus rate is equal to or more than said second air surplus rate, and said fourth air surplus rate is equal to or more than said third air surplus rate.

19. The combustion method according to claim 15, said first to third temperature ranges are a range of

800 °C to 900 °C.

20. The combustion method according to claim 15, wherein said fourth temperature range is equal to or lower than each of said first to third temperature ranges, and a range of 750 °C to 850 °C.

21. The combustion method according to claim 15, wherein a residence time of a combustion gas in said first combustion section is in a range of 1.5 to 2.5 seconds,

5 a residence time of a combustion gas in said second combustion section is in a range of 0.5 to 1.5 seconds,

a residence time of a combustion gas in said first combustion section is in a range of 0.1 to 1.0  
10 second, and

a residence time of a combustion gas in said first combustion section is in a range of 1.5 to 2.5 seconds.

22. A fluidized bed incinerator having a combustion furnace comprising:

first to fourth combustion sections, and  
wherein a fuel is supplied to said first  
5 combustion section and an combustion exhaust gas is exhausted after said fourth combustion section,

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first to fourth airs are supplied to said first to fourth combustion sections in first to fourth air surplus rates, respectively, and

10 a residence time of gas corresponding to the fuel in said first combustion section is in a range of 1.5 to 2.5 seconds;

a residence time of the gas in said second combustion section is in a range of 0.5 to 1.5  
15 seconds;

a residence time of the gas in said third combustion section is in a range of 0.1 to 1.0 seconds; and

20 a residence time of the gas in said fourth combustion section is equal to or more than 1.5 to 2.5 seconds.

23. A fluidized bed incinerator having a combustion furnace comprising:

first to fourth combustion sections, and  
wherein a fuel is supplied to said first  
5 combustion section as a fluidized bed section and an  
combustion exhaust gas is exhausted after said fourth  
combustion section,

first to fourth airs are supplied from first  
to fourth air supply ports to said first to fourth  
10 combustion sections, respectively, and  
said first air supply port is provided in a

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bottom of said combustion furnace,

said second air supply port is provided in a range of 1500 to 2100 mm from the bottom;

15       said third air supply port is provided in a range of 3100 3700 mm from said bottom; and

      said fourth air supply port is provided in a range of 4100 to 4700 mm from said bottom.

24.       The fluidized bed incinerator according to claim 23, wherein said combustion furnace further comprises a fuel input port provided in a range of 2100 to 2700 mm from the bottom.

25.       A fluidized bed incinerator having a combustion furnace comprising:

5       a first combustion section as a fluidized bed section to which fuel is supplied and first air is supplied from a first air supply port;

      a second combustion section to which second air is supplied from a second air supply port;

10      a third combustion section to which third air is supplied from a third air supply port;

      a fourth combustion section to which fourth air is supplied from a fourth air supply port, and an combustion exhaust gas is exhausted after said fourth combustion section.